

Fig-1

Common Parts Matrix					
	A	B	C	D	E
A	42				
B	40	51			
C	24	2	65		
D	41	9	1	65	
E	27	305	2	54	60

Different Parts Matrix					
	A	B	C	D	E
A	0				
B	13	0			
C	59	112	0		
D	25	98	128	0	
E	48	51	21	17	0

Minutes to Load Feeders					
	A	B	C	D	E
A	0				
B	39	0			
C	177	336	0		
D	75	294	384	0	
E	144	153	63	51	0

Fig-2

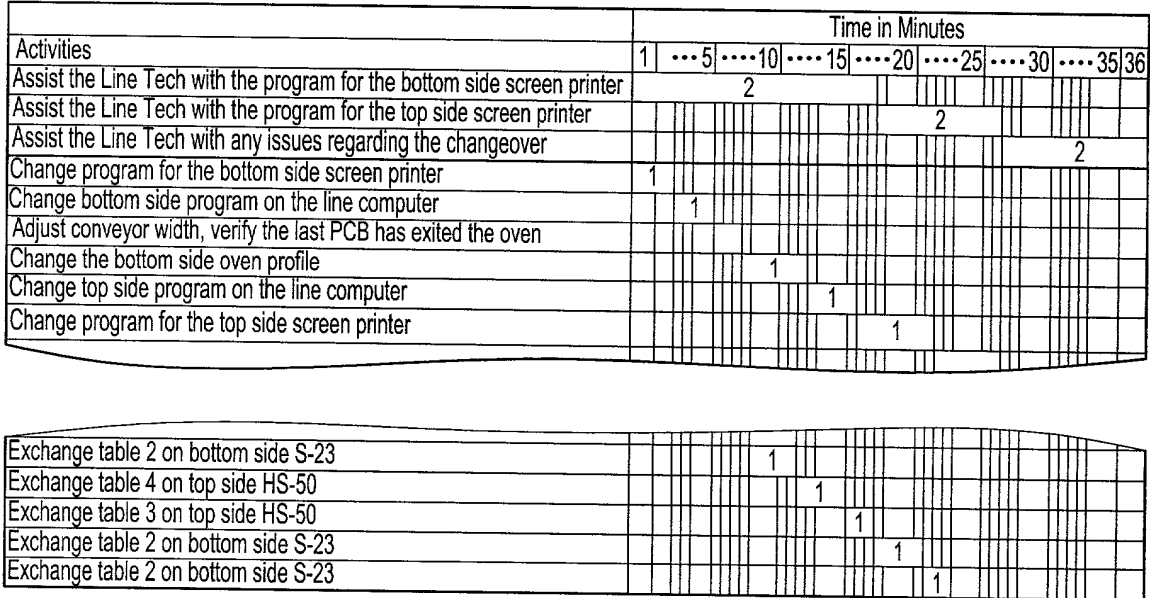
Number of Feeder Tables to Replace											
	0	1	2	3	4	5	6	7	8	9	10
0	0	3	6	9	12	15	18	21	24	27	30
1	2	5	8	11	14	17	20	23	26	29	32
2	4	7	10	13	16	19	22	25	28	31	34
3	6	9	12	15	18	21	24	27	30	33	36
4	8	11	14	17	20	23	26	29	32	35	38
5	10	13	16	19	22	25	28	31	34	37	40

26	52	55	58	61	64	67	70	73	76	79	82
27	54	57	60	63	66	69	72	75	78	81	84
28	56	59	62	65	68	71	74	77	80	83	86
29	58	61	64	67	70	73	76	79	82	85	88
30	60	63	66	69	72	75	78	81	84	87	90

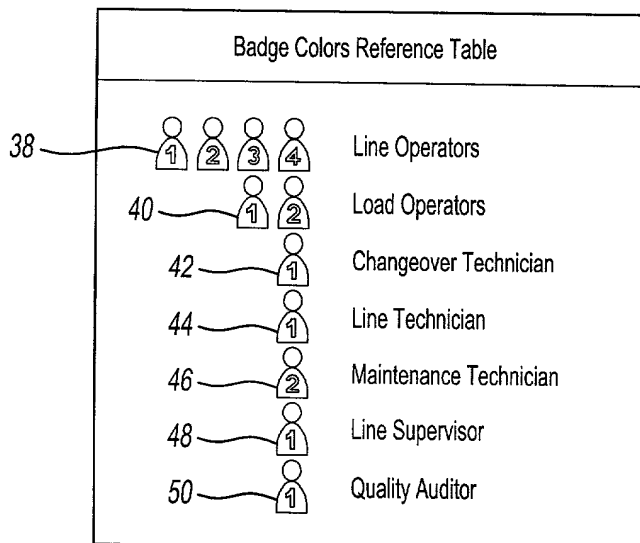
Fig-3

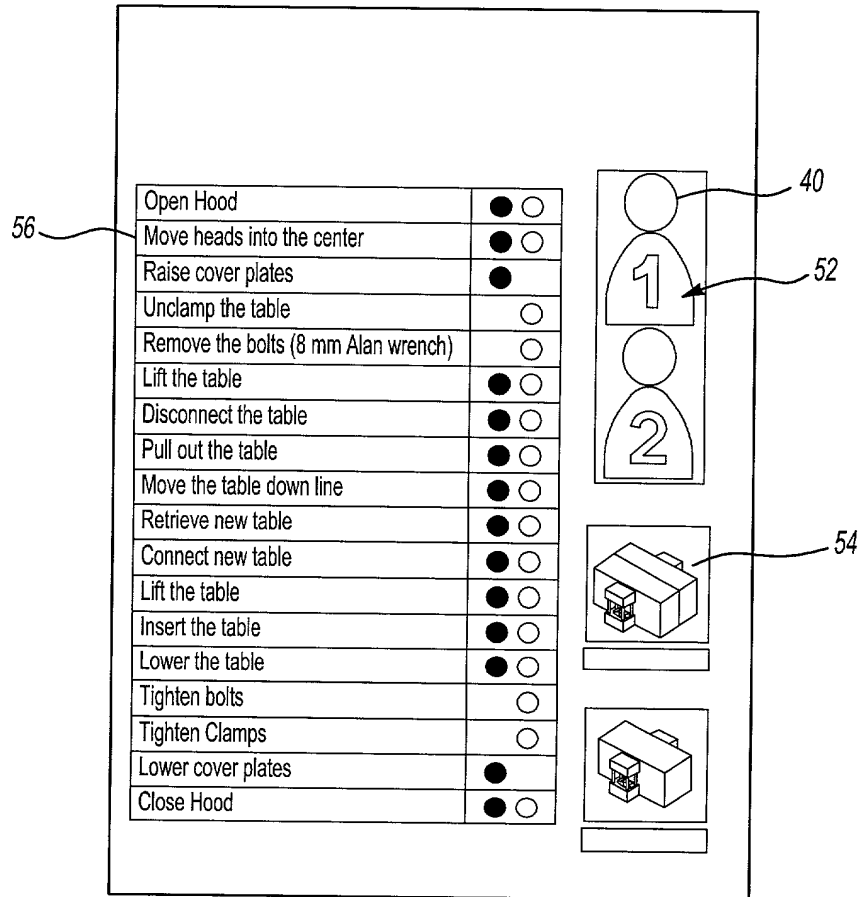
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Line Changeover Gantt Chart

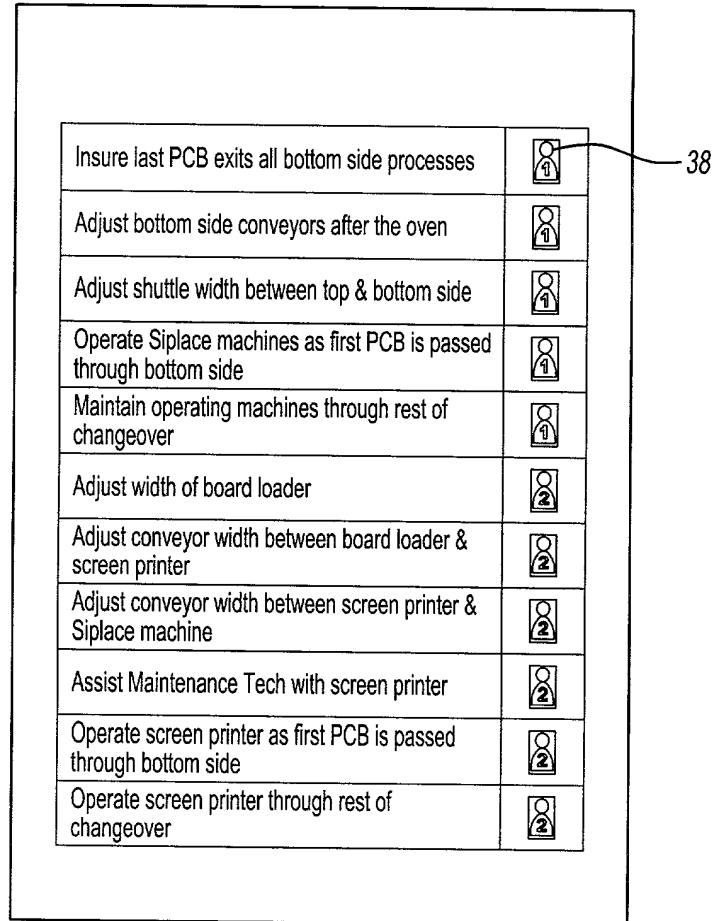
**Fig-4**

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**Fig-5**

Fig-6A

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





Insure last PCB exits all bottom side processes	
Adjust bottom side conveyors after the oven	
Adjust shuttle width between top & bottom side	
Operate Siplace machines as first PCB is passed through bottom side	
Maintain operating machines through rest of changeover	
Adjust width of board loader	
Adjust conveyor width between board loader & screen printer	
Adjust conveyor width between screen printer & Siplace machine	
Assist Maintenance Tech with screen printer	
Operate screen printer as first PCB is passed through bottom side	
Operate screen printer through rest of changeover	

Fig-6B

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

Operate top side equipment until last PCB enters Siplace equipment	 	38
Insures last PCB exits all top side processes		
Adjust conveyor width between Siplace machines & oven		
Adjust conveyor width after the oven		
Operate Siplace machines as first PCB is passed through top side		
Maintain operating machines through rest of changeover		
Prepare screen printer for changeover		
Assist line tech with screen printer		
Adjust conveyor width between screen printer & Siplace machine		
Assist maintenance tech with screen printer		
Operate screen printer as first PCB is passed through top side		
Operate screen printer through rest of changeover		

Fig-6C

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Assist the Line Tech with the program for the bottom side screen printer		46
Assist the Line Tech with the program for the top side screen printer		
Assist the Line Tech with any issues regarding the changeover		
Change program for the bottom side screen printer		44
Change bottom side program on the line computer		
Adjust conveyor width, verify the last PCB has exited the oven		
Change the bottom side oven profile		
Change top side program on the line computer		
Change program for the top side screen printer		
Change the top side oven profile		
Address any issues regarding the changeover		

Fig-6D


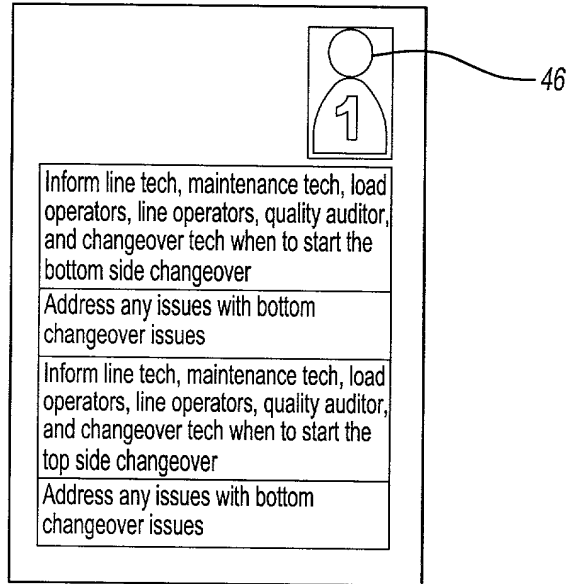
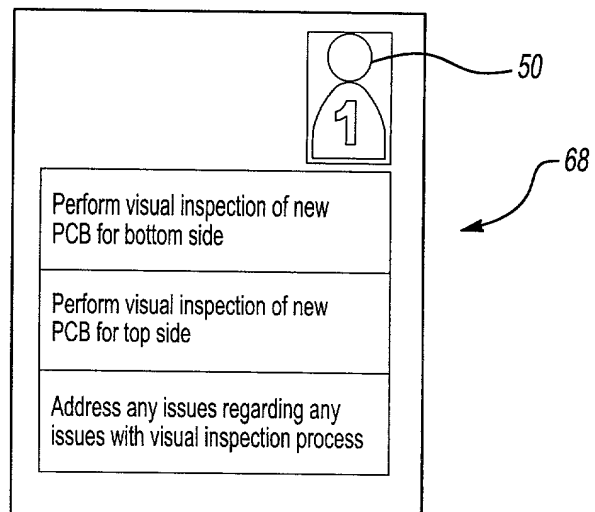
	44
Verify that the last PCB has exited the Siplace machines	
Check nozzle configuration for the new setup on bottom side	
Check nozzle configuration for the new setup on top side	
Assist on any issues regarding the changeover	64

Fig-6E

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**Fig-6F****Fig-6G**

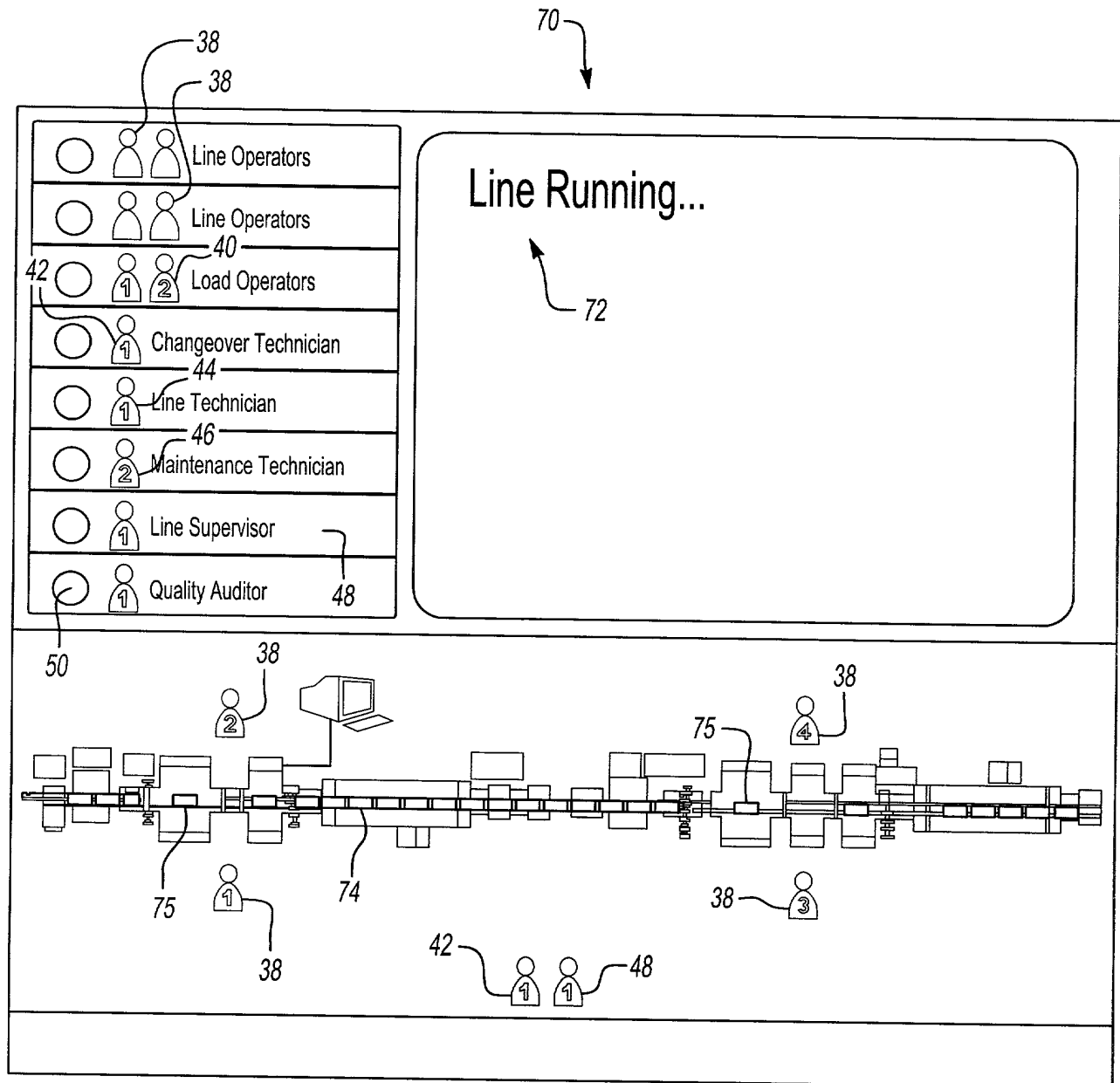


Fig-7A

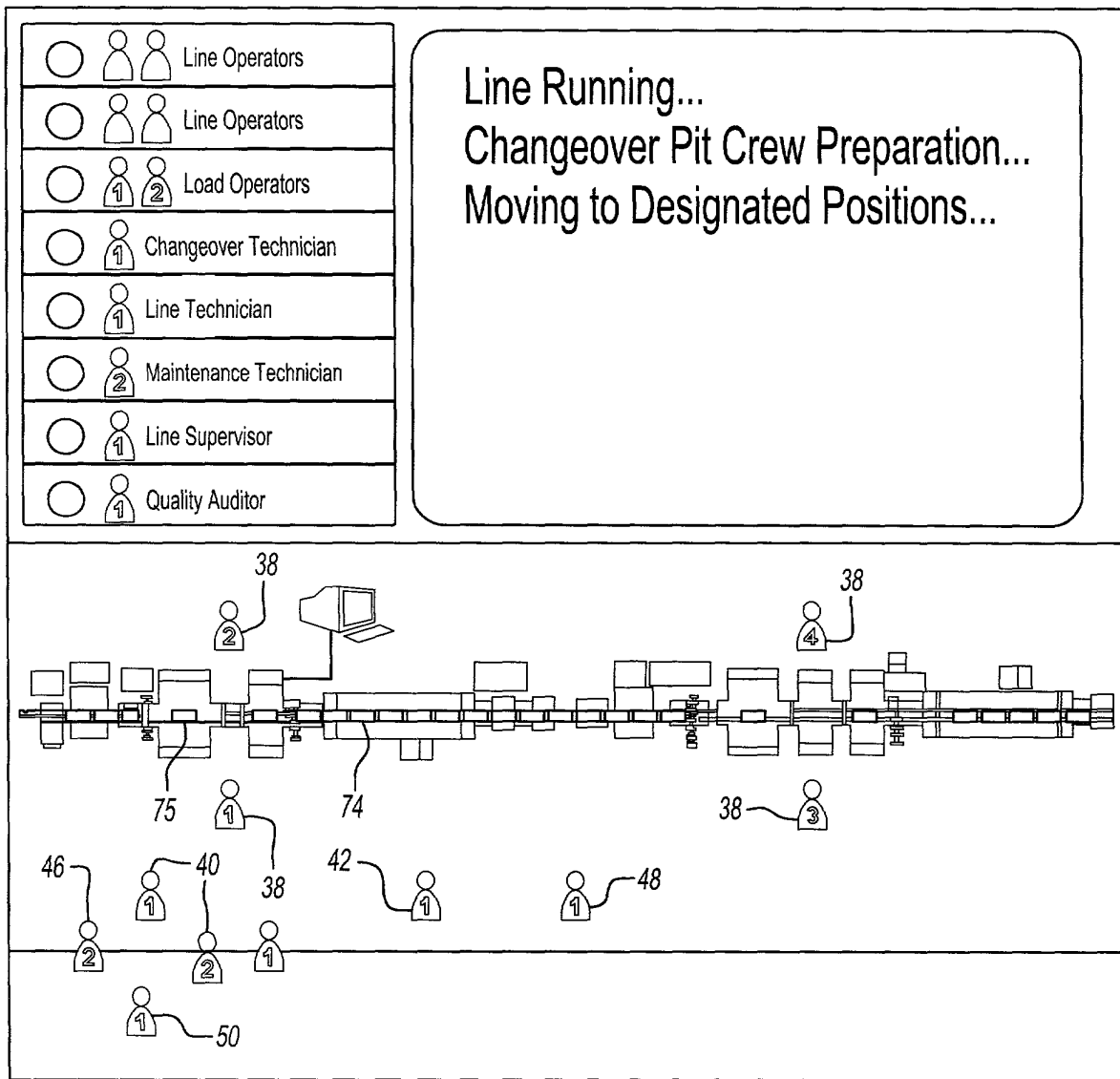


Fig-7B

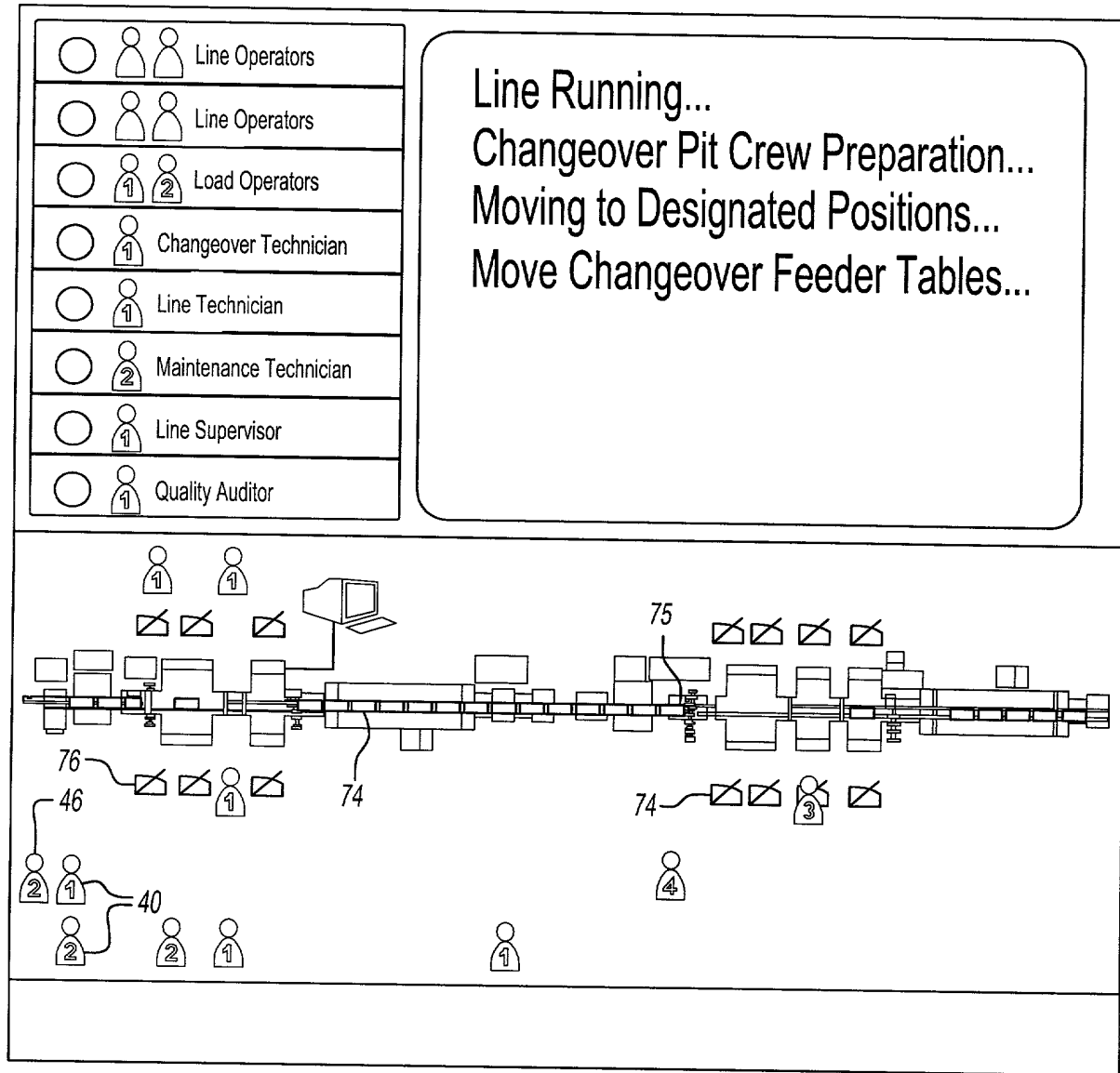
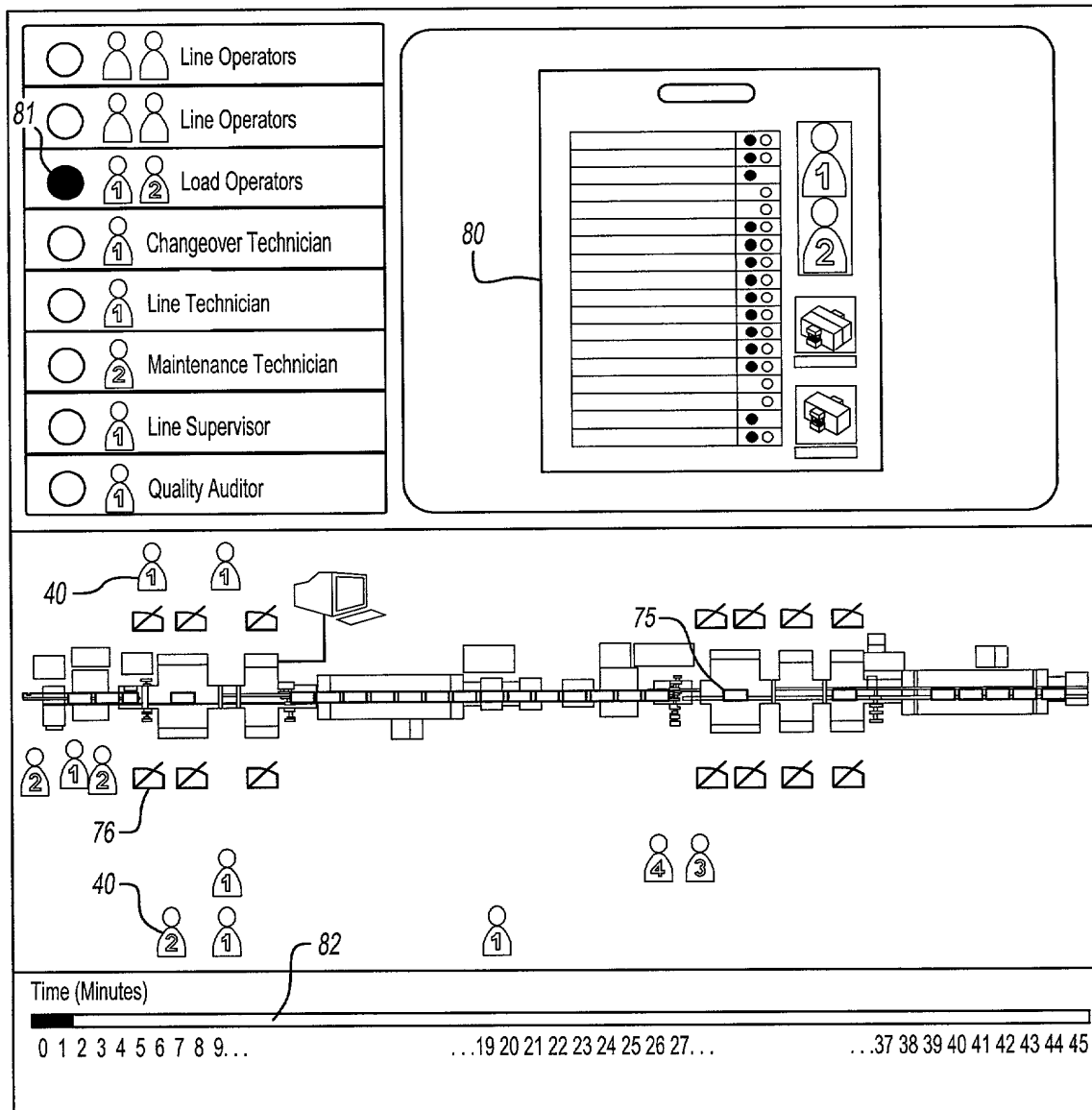
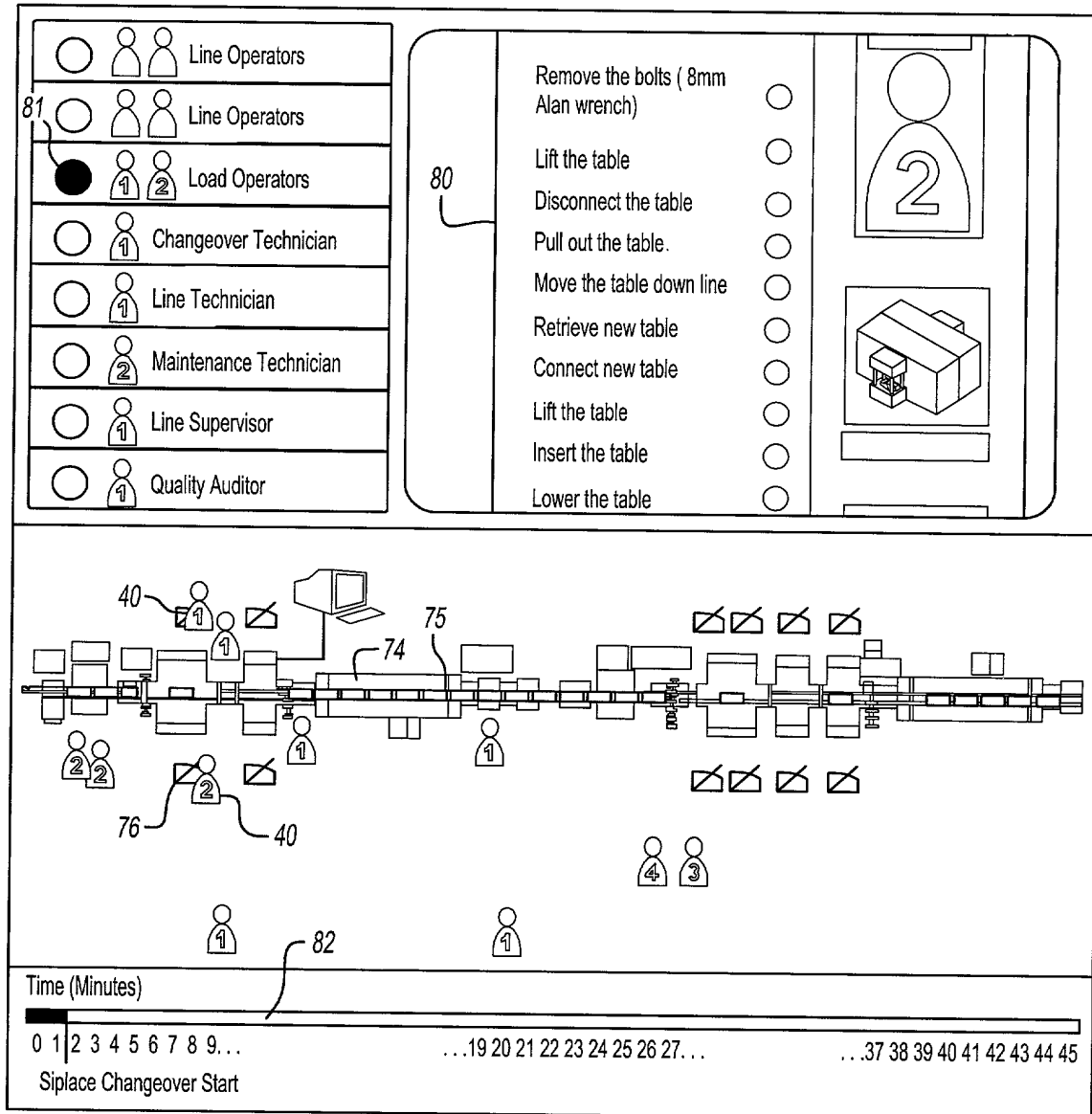
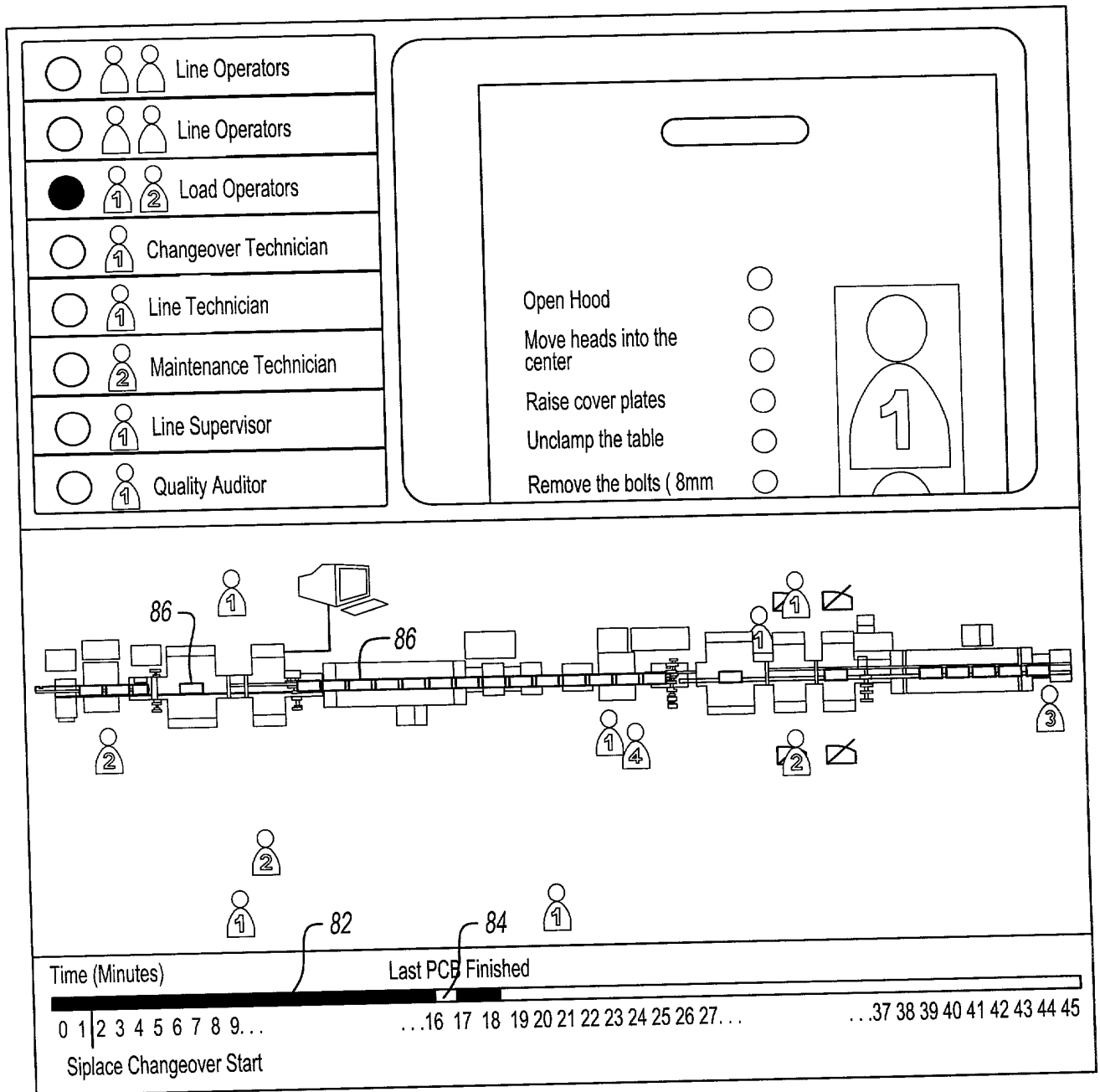


Fig-7C

**Fig-7D**

**Fig-7E**

**Fig-7F**

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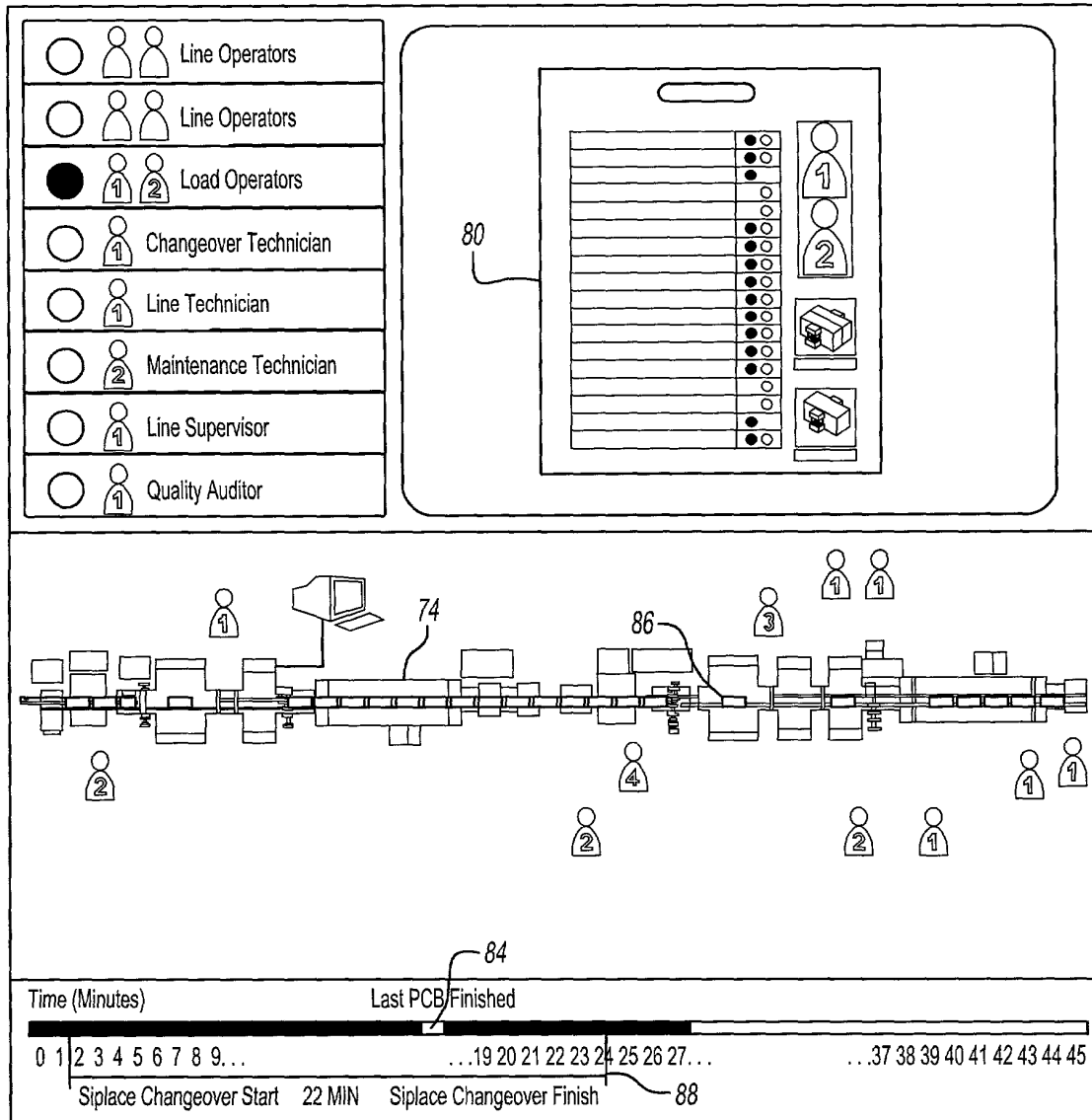


Fig-7G

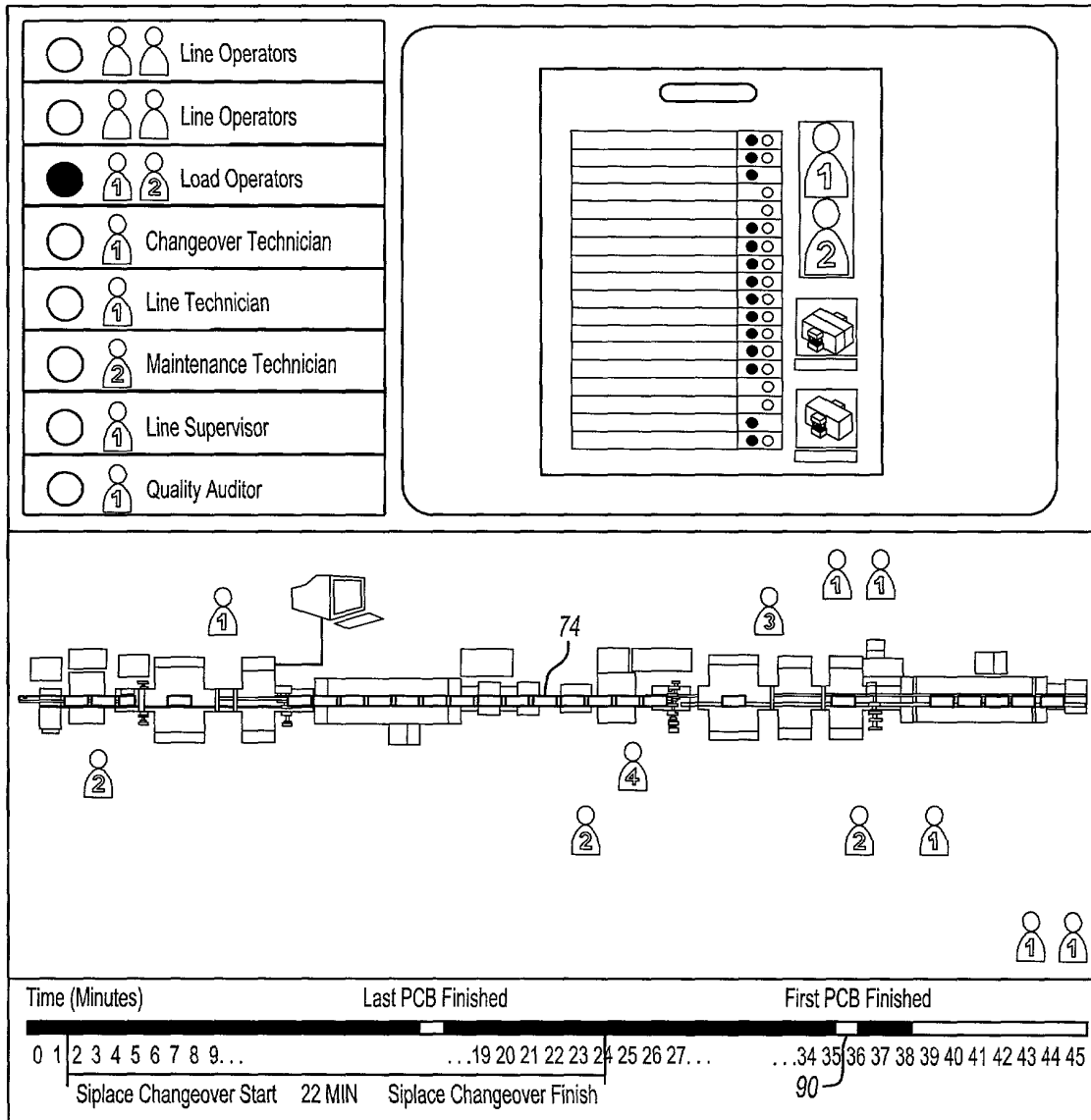
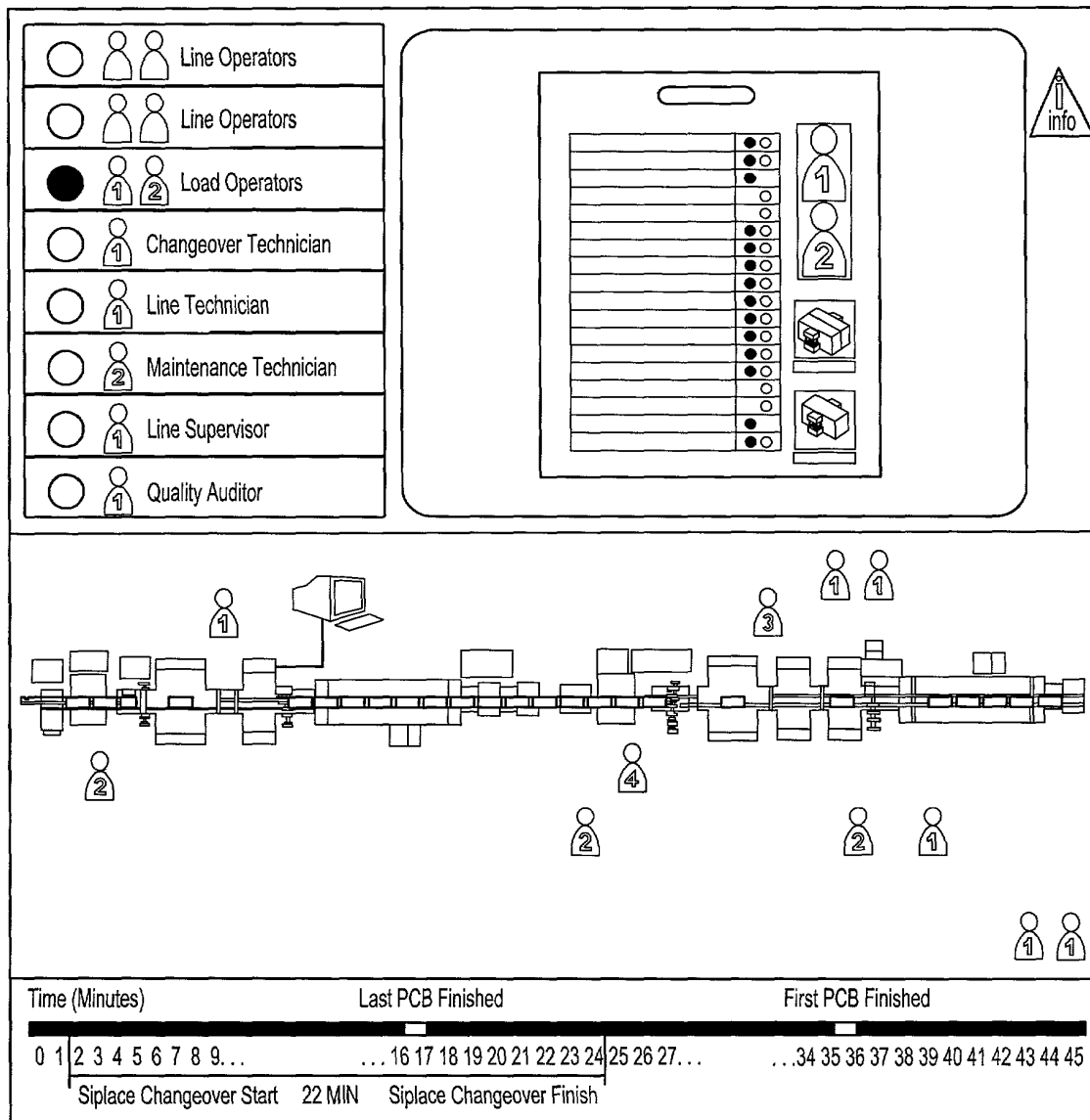
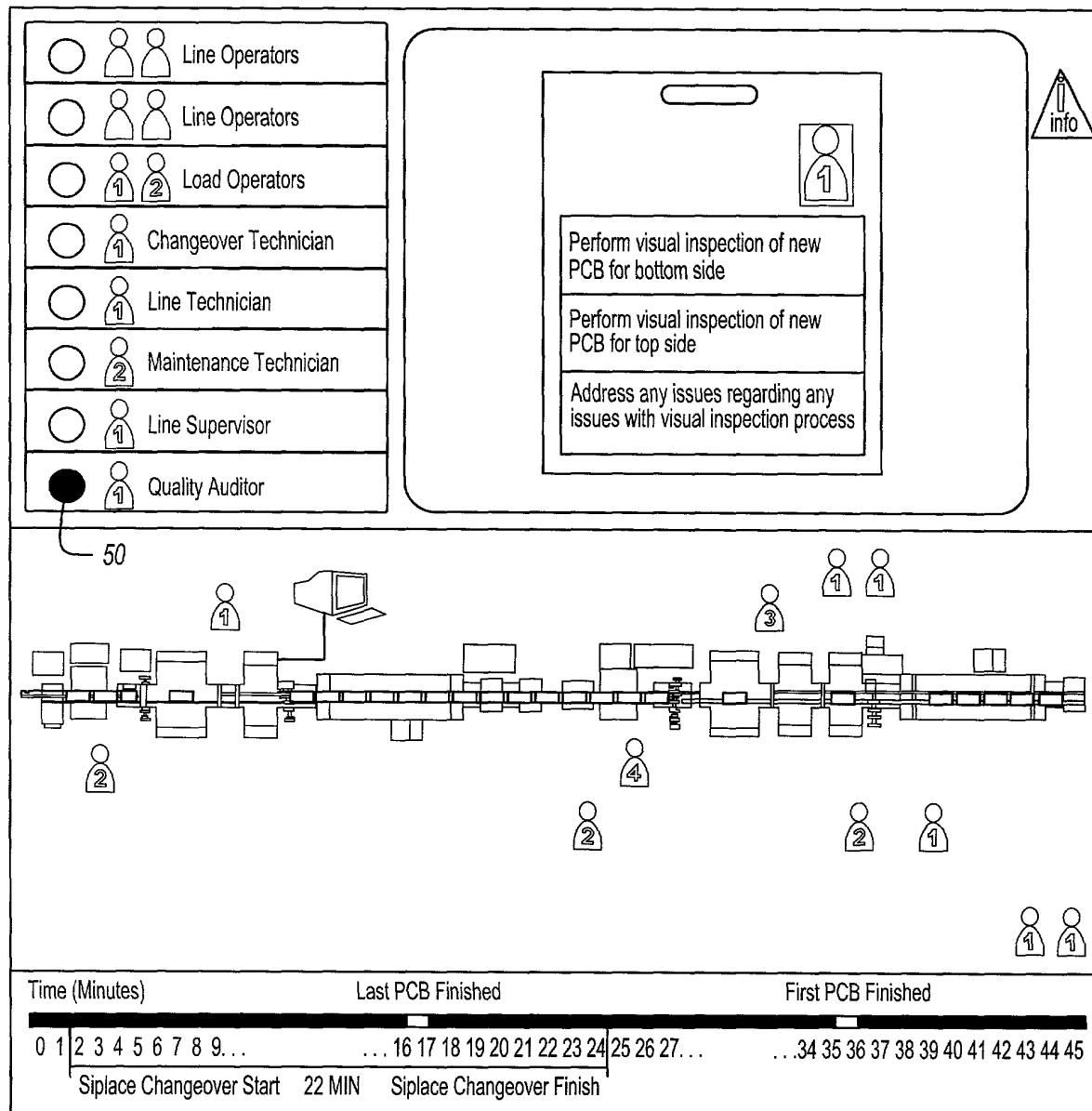


Fig-7H

**Fig-71**

**Fig-7J**